

CLAIMS:

1. A method for making a preform from thermoplastic material for use in making a compression molded optical product comprising:

- a) placing a convex and a concave mold in a press;
- b) heating a thermoplastic material in a reservoir to form a fluid;
- c) heating said molds to a temperature above room temperature;
- d) said reservoir having a fluid outlet located in close proximity to said concave mold;
- e) dispensing a predetermined amount of said fluid thermoplastic material from said outlet onto the outside edge at a point spaced one-half ( $\frac{1}{2}$ ) the radius or greater from the center of said heated concave mold prior to said fluid solidifying so that said fluid makes point or line contact as it contacts the concave mold and flows into said concave mold to form a blob of thermoplastic material having a greater thickness at the center of said concave mold and a smaller diameter than the resulting molded article;
- f) allowing said blob to cool to below its melting temperature thereby converting the material to a monolithic preform mass

having a skin and having a flat to slightly convex surface which will make point contact with the convex mold to preclude the entrapment of air and formation of air bubbles in a finished compression molded final finished product.

2. The method according to claim 1 wherein said heated reservoir is an extruder said extruding having a barrel; said fluid outlet located in said barrel.

3. The method according to claim 2 wherein said outlet is located 1 inch or less above said concave mold.

4. The method according to claim 2 wherein said outlet is located at 0.5 inch or less above said concave mold.

5. The method according to claim 2 wherein said outlet is located about 0.25 inch above said concave mold.

6. The method according to claim 2 wherein said outlet is located about 0.5 to 0.125 inches above said concave mold.

7. The method according to claim 2 wherein said extruder includes a temperature controller to regulate the temperature of said barrel.

8. The method according to claim 6 wherein said extruder has an idle setting wherein the barrel of said extruder is cooled to prevent heat degradation of said thermoplastic material when said extruder is not in use.

9. The method according to claim 1 wherein said thermoplastic material is norborene copolymer.

10. The method according to claim 1 wherein said thermoplastic material is polycarbonate.

11. The method according to claim 1 wherein said molds are heated to within a few degrees of the transition temperature of the thermoplastic material.

12. The method according to claim 1 wherein said molds are heated to a temperature of about 1° to 10° C below the transition temperature of the thermoplastic material.

13. The method according to claim 1 wherein said molds are heated to a temperature of about 1° to 5° C below the transition temperature of the thermoplastic material.

14. The method according to claim 1 wherein said molds are heated to about the transition temperature of the thermoplastic material.

15. The method according to claim 3 wherein said concave said concave mold is mounted on a horizontally movable tray so that said concave mold can be moved outside of said press during dispensing of said thermoplastic material.

16. The method according to claim 3 wherein said optical product is an optical lens.

17. The method according to Claim 16 further comprising an extruder containing said reservoir; said extruder having a barrel having said fluid outlet.

18. The method according to Claim 17 wherein said barrel is movable so that said outlet can be positioned in close proximity to said concave mold.

19. The method according to Claim 18 further comprising said extruder including a temperature regulator on said barrel to lower the temperature of said barrel when said extruder is idle.

20. An apparatus for making molded optical articles comprising

- a) a press;
- b) a pair of molds located within said press;
- c) said pair of molds including a concave and a convex mold;
- d) a heated reservoir to fluidize a thermoplastic optical material;
- e) said heater having a fluid outlet located in close proximity to said concave mold to dispense fluid thermoplastic optical material on said concave lens mold;
- f) means to control the amount of fluid thermoplastic optical material dispensed to said concave mold.

21. The apparatus according to Claim 20 wherein said fluid outlet is located adjacent to an edge of said concave mold so said fluid is dispensed near

the outer periphery of said mold, whereby said fluid flows toward the center of said concave mold to substantially fill said mold.

22. The apparatus according to Claim 21 wherein said fluid forms a blob by thermoplastic optical material having a greater thickness at the center of said concave mold than at the periphery of said mold.

23. The apparatus according to Claim 20 wherein said fluid outlet is located a distance of about 1 inch or less above said concave mold.

24. The apparatus according to Claim 23 wherein said fluid outlet is located a distance from about 0.5 in. to 0.125 inch above said concave mold.

25. The apparatus according to Claim 23 wherein said fluid outlet is located a distance of about 0.25 in above said concave mold.

26. The apparatus according to Claim 1 further comprising means to heat said molds.

27. The apparatus according to Claim 20 further comprising an extruder; said extruder having a barrel; said barrel including said outlet.

28. The apparatus according to Claim 27 further comprising said barrel having a temperature regulator to cool said barrel when said extruder is idle.

29. An apparatus for making molded optical articles comprising;

- a) a plurality of presses;
- b) a pair of molds located within each said press;
- c) said pair of molds including a concave and a convex mold;
- d) means to heat said concave mold;

- e) an extruder to fluidize a thermoplastic optical material;
- f) said extruder having a fluid outlet in said barrel; said outlet positioned in close proximity to said concave mold to dispense fluid thermoplastic optical material on said concave lens mold;
- g) means to control the amount of fluid thermoplastic optical material dispensed to said concave mold;
- h) said extruder movable so that the said outlet in barrel can be positioned to dispense said thermoplastic material to each concave mold in said plurality of presses.

30. The apparatus according to Claim 29 wherein said plurality of presses are located adjacent on another to form an arc; said extruder is mounted on a rotating platform.

31. The apparatus according to Claim 29 wherein said concave mold is mounted on a horizontally movable tray within said press so that said concave mold can be moved outside said press during dispensing of thermoplastic material to said concave mold.

32. An improved method for the rapid on-site making of a lens in a few minutes from thermoplastic material comprising the steps of:

- a) placing a convex and concave lens mold in a press;
- b) heating said molds to a temperature above room temperature;
- c) heating a thermoplastic material in a reservoir to form a fluid;

d) said reservoir having a fluid outlet located in close proximity to an outer edge of said concave mold;

e) dispensing a predetermined amount of said fluid thermoplastic material from outlet onto the outer edge of concave mold prior to said fluid solidifying so that said fluid makes point contact as it first contacts the concave mold and flows into said concave mold to form a blob of thermoplastic material having a greater thickness at the center of said concave mold than at the periphery of said concave mold;

f) allowing said blob to cool to below its melting temperature thereby converting the material to a monolithic preform mass having a flat to slightly convex surface which will make point contact with the convex mold to preclude the entrapment of air and formation of air bubbles in the finished lens;

g) closing and pressing said lens molds toward each other and against said preform mass so as to mash down said preform mass;

h) continuing to heat said molds until said preform mass reaches a temperature at which said preform mass; is almost flattened out between said molds;

i) maintaining said temperature and maintaining pressure on said molds until said preform mass is reconfigured and/or transformed

by compression molding into a lens defined by said pair of molds with any excess preform material expelled from between said pair of molds; and

j) terminating the heating of said molds and thereafter removing a formed lens from said pair of molds.

33. The method according to claim 32 wherein said fluid is thermoplastic material introduced into said concave mold at a point near the edge of said concave mold so that said fluid flows toward the center of the mold.

34. The method according to claim 32 further comprising cooling said molds after said preform mass has been reconfigured and/or transformed.

35. The method according to claim 32 further comprising in;

a) said concave mold is mounted on a horizontally movable tray so that said concave mold can be moved outside of said press during dispensing of said thermoplastic material.

36. The method according to Claim 32 further comprising said extruder including a temperature regulator on said barrel to lower the temperature of said barrel when said extruder is idle.